Date:

25 November 1998

To:

Bechtel Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

107-D1Trench - Confirmation

Subject: Inorganics - Data Package No. W01811-QES (SDG No. W01811)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W01811-QES prepared by Quanterra Environmental Services (QES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOKOF4	7/29/97	Soil	С	Lead (7421); Chrome VI (7196)
- BOKOF5	7/29/97	Soil	С	Lead (7421); Chrome VI (7196)
BOKOF6	7/29/97	Soil	С	Lead (7421); Chrome VI (7196)
BOKOF7	7/29/97	Soil	С	Lead (7421); Chrome VI (7196)
BOKOF8	7/29/97	Soil	С	Lead (7421); Chrome VI (7196)
воконо	7/29/97	Soil	С	Lead (7421); Chrome VI (7196)
вокон1	7/29/97	Soil	С	Lead (7421); Chrome VI (7196)

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding time for lead were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Solid samples must be analyzed within six (6) months for lead and 30 days for chromium VI.

All holding times were acceptable.

Blanks

Preparation Blanks

At least one preparation blank, processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field and Equipment Blanks

One equipment blank (B0K0H1) and one field blank (B0K0H0) were submitted for analysis. Lead was detected in both the field and the equipment blank. Under the BHI statement of work, no qualification is required.

Accuracy

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy spike recovery results were acceptable.

Precision

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ".

All laboratory duplicate recovery results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOKOF7/BOKOF8) were submitted to QES for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. The RPD for lead was outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the requirements on

page II-5 of the 100 Area Remedial Action Sampling and Analysis Plan to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific CRDL.

Completeness

Data package No. W01811-QES (SDG No. W01811) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found, although lead was detected in both the field and equipment blank and the field duplicate results for lead were outside QC limits.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, May 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W01811	REVIEWER: TLI	DATE: 11/25/98	PAGE_1_OF_1_
COMMENTS: None assigne	ed.		
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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: BECHTEL-HAN	IFORD			7										-											
Laboratory: Quanterra				1																					
Case	SDG: V	V01811		1									,												
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Matrix (soil/wasevel (low/med) Solids:	ater): SOIL		I	lab Sample	ID: 15452-003 ved: 07/29/97
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Nov. 11/25/98 11/25/98

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Lab Name: QUANTERRA M	0	Contract: 550		1	воконі				
Matrix (soil/water): Level (low/med):	se No.: SOIL_ LOW _99.7	SAS No.: SDG No.: W01811 Lab Sample ID: 15452-0 Date Received: 07/29/9							
Concentra	tion Units (ug	/L or mg/kg dry	y we:	ight):	MG/KG				
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LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740801

MATRIX:

SOIL

CLIENT ID:

B0K0F4

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-2 38	- 8:21E-03	1:6E-02	1.7E-02	4.07E-02	pGi/g	37.40%	RICHRESO10
PU239/40	7.51E-03	1.6E-02	1.6E-02	3.28E-02	pCi/g	37.40 ts	RICHRC5010
AM-241	3.20E-02	3.4E-02	3.4E-02	5.63E-02	pCi/g	NA	RICHRC5017
CO-60	1.94E-02	8.3E-03	8.5E-03	1.63E-02	pCi/g	MIA	RICHRC5017
CS-137DA	4.79E-02	2.0E-02	2.1E-02	N/A	pCifg \	N/A	RICHRC5017
EU-152	5.21E-02	2.2E-02	2.3E-02	3.89E-02	pCi/g	N/A	RICHRC5017
EU-154	1.27E-03	2.8E-02	2.8E-02	4.83E-02	pCi/g	N/A	RICHRC5017
EU-155	1.92E-02	2.6E-02	2.6E-02	4.08E-02	pCi/g	N/A	RICHRC5017
K-40	1.02E+01	4.0E-01	1.1E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.25E-01	2,5€-02	5.8E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	4.06E-01	3.2E-02	5.2E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	\$:02E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.63E-01	2.9E-01	3.0E-01	4.92E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	7.22E-02	3.7E-02	4.6E-02	1.13E-01	pCi/g	92.20%	RICHRC5006

Number of Results: 15

MU 25/58



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740802

MATRIX:

SOIL

CLIENT ID:

B0K0F5

DATE RECEIVED:

7/29/1997 11:35:00 AM

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	ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER	
	HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A .	EPA7196	
	_ PU 238	5.77E 03	1:7E-02	1.7E-02	-4.53E-02	- pCi/g	37.40%	RICHRC5910	
-	PU239/40	2.48E-02	2.9E-02	3.0E-02	3.41E-02	pCi/g	37.40%	RICHRC5010	
	AM-241	-1.48E-02	3.2E-02	3.2E-02	5.15E-02	pCi/g	N/A	RICHRC5017	
	CO-60	6.21E-03	9.6E-03	9.6E-03	1.70E-02	pCi/g	MA	RICHRC5017	
	CS-137DA	9.25E-03	8.4E-03	8.5E-03	1.47E-02	PCi/g	N/A	RICHRC5017	
	EU-152	1.61E-02	2.0E-02	2.0E-02	3/49E-02	pCi/g	N/A	RICHRC5017	
	EU-154	-8.57E-03	3.1E-02	3.1E-02	5:07E-02	pCi/g	N/A	RICHRC5017	
	EU-155	3.90E-02	2.5E-02	2.6E-02	4.12E-02	pCi/g	N/A	RICHRC5017	
	K-40	1.13E+01	4.4E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017	
	RA-224DA	6.21E-01	2.8E-02	6.8E-02	N/A	pCi/g	N/A	RICHRC5017	
	RA-226DA	4.78E-01	3.7E-02	6.0E-02	N/A	pCi/g	N/A	RICHRC5017	
	RA-228DA	6.57E-01	6.8E-02	9.5E-02	N/A	pCi/g	N/A	RICHRC5017	
	U-238	1.74E-01	3.4E-01	3.4E-01	N/A	pCi/g	N/A	RICHRC5017	
	STRONTIUM	4.79E-02	3.5E-02	3.9E-02	1.17E-01	pCi/g	90.90%	RICHRC5006	

Number of Results: 15

11/25/98 M



LAD NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740803

MATRIX:

SOIL

CLIENT ID:

BOK0F6

DATE RECEIVED:

7/29/1997 11:35:00 AM

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ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER	
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	. EPA7196	
PU-238	7.76E-04	1.6E-03	1.6E 03	3.00E-02	-pCi/g	43.40%	RIGHRO5010	
PU239/40	6.60E-03	2.0E-02	2.0E-02	5.18E-02	pCi/g	43.40%	A PRICHRC5010	
AM-241	3.89E-03	4.6E-02	4.7E-02	7.75E-02	pCi/g	N/A	RICHRC5017	
CO-60	-2.23E-03	8.8E-03	8.8E-03	1.46E-02	pCi/g	N/A	RICHRC5017	
CS-137DA	2.90E-02	1.2E-02	1.2E-02	N/A	pel/g	N/A	RICHRC5017	
€U-152	4.58E-02	2.0E-02	2.0E-02	3.56E-02	pCi/g	N/A	RICHRC5017	
EU-154	2.21E-02	2.5E-02	2.5E-02	4.48E-02	pCi/g	N/A	RICHRC5017	
EU-155	3.10E-02	2.3E-02	2.4E-02	3.90E-02	pCi/g	N/A	RICHRC5017	
K-40	9.34E+00	3.7E-01	1.0E+00	N/A	pCi/g	N/A	RICHRC5017	
RA-224DA	4.77E-01	2.8E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017	
RA-226DA	3.91E-01	3.2E-02	5.1E-02	N/A	pCi/g	N/A	RICHRC5017	
RA-228DA	5.06E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017	
U-238	5.23E-01	5.1E-01	5.1E-01	N/A	pCi/g	N/A	RICHRC5017	
STRONTIUM	4.63E-02	3.6E-02	3.9E-02	1.20E-01	pCi/g	84.40%	RICHRC5006	

Number of Results: 15

Pll 1/25/98



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740804

MATRIX:

SOIL

CLIENT ID:

B0K0F7

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A -	EPA7196
PU-238	-9.05E-04	1.8E-03	1.8E-03	4:55E-02	pCi/g	-35.50% -	RICHRC5010
PU239/40	3.21E-02	3.9E-02	4.0E-02	5.16E-02	pCi/g	35.50%	RICHRC5010
AM-241	-241 5.90E-02 3.4E-0		3.4E-02	5.58E-02	pCi/g	N/A\	RICHRC5017
CO-60	3.34E-02	1.1E-02	1.1E-02	2.17E-02 pCi/g N/A		RICHRC5017	
CS-137DA	2.01E-01	1.8E-02	2.7E-02	N/A Delig N/A		N/A	RICHRC5017
EU-152	3.74E-01	4.5E-02	5.9E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	4.51E-02	3.2E-02	3.2E-02	5.67E-02	pCi/g	N/A	RICHRC5017
EU-155	EU-155 3.96E-02 2.7E-0		2.85-02	4.42E-02	pCi/g	N/A	RICHRC5017
K-40	1.07E+01	4.2E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.57E-01	2.0E-02	6.3E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	4.65E-04	3.9E-02	6.1E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	5.71E-01	7.5E-02	9.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	8.40E-01	4.1E-01	4.2E-01	N/A	pCi/g	N/A	RICHRC5017
SPRONTIUM	2.37E-01	5.9E-02	1.0E-01	1.41E-01	pCi/g	90.10%	RICHRC5006
Num	ber of Resul	its: 15					pll/25/68



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740805

MATRIX:

SOIL

CLIENT ID:

B0K0F8

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A ·	EPA7196
PU-238	1.22E-03	1.7E-03	1.7E-03	- 3.48E-02-	pGi/g	40.80%	RICHRC5018
PU239/40	3.51E-02	3.4E-02	3.5E-02	4.31E-02	pCi/g	40.80%	A RICHRC5010
AM-241	5.40E-03	3.6E-02	3.6E-02	5.66E-02	pCi/g	NIASA	RICHRC5017
CO-60	3.02E-02	1.1E-02	1.1E-02	2.10E-02	pCi/g	NA	RICHRC5017
CS-137DA	1.74E-01	1.6E-02	2.4E-02	N/A	DCH9	NIX	RICHRC5017
EU-152	3.32E-01	4.2E-02	5.4E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	7.62E-03	3.1E-02	3.1E-02	5.28E-02	pCi/g	N/A	RICHRC5017
EU-155	3.18E-02	2.5E-02	2.55-02	4.17E-02	pCi/g	N/A	RICHRC5017
K-40	9.80E+00	3.9E-01	1.1E+00	N/A	pCi/g	N/A	RICHRCS017
RA-224DA	5.11E-01	2,62.02	5.7E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	3.98E-01	3.6E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	\$.15E-01	7.1E-02	8.8E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.26E-01	3.0E-01	3.1E-01	4.99E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	3.04E-01	6.1E-02	1.2E-01	1.15E-01	pCi/g	93.70%	RICHRC5006

Number of Results: 15

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LAB NAME:

CLIENT ID:

LAB SAMPLE ID:

QUANTERRA, Richland

707/0000

70740806

воконо

SDG: /RPT GRP:

W01811 / 3274

MATRIX:

SOIL

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A ,	EPA7196
PU 238	- 0.00E+00	0.0E+00	3.2E 02	2.88E-02	ρCi/g	- 28.60%	RICHRE5010
PU239/40	-8.51E-04	1.7E-03	1.7E-03	4.28E-02	pCi/g	28.00%	RICHRC5010
,AM-241	-1.38E-02	2.9E-02	2.9E-02	4.54E-02	pCi/g	All	RICHRC5017
CO-60	9.53E-03	8.0E-03	8.1E-03	1.50E-02	pCi/g	NIA	RICHRC5017
CS-137DA	4.61E-03	6.6E-03	6.6E-03	1.11E-02	96/19	N/A	RICHRC5017
EU-152	8.22E-03	1.7E-02	1.7E-02	2.86E-02	pCi/g V	N/A	RICHRC5017
EU-154	-1.25E-03	3.3E-02	3.3E-02	5.51E-02	pCi/g	N/A	RICHRC5017
EU-155	2.38E-02	1.9E-02	1.9E-02	3.30E-02	pCi/g	N/A	RICHRC5017
K-40	1.61E+01	4.7E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	2.26E-01	1.8 E -02	2.9E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	1.98E-01	3.0E-02	3.6E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	2.03E-01	5.2E-02	5.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	1.14E-01	2.5E-01	2.5E-01	4.00E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	2.66E-02	3.1E-02	3.2E-02	1.15E-01	pCi/g	90.10%	RICHRC5006

Number of Results: 15

0001

per | 58



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740807

MATRIX:

SOIL

CLIENT ID:

B0K0H1

DATE RECEIVED:

7/29/1997 11:35:00 AM

								_
 ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER	
 HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196	
PU-238	3.47É-03	9.2E-03	9.2E-03	2.28E-02	pCi/g	66.90%	RICHRC5010	
PU239/40	-3.65E-04	7.3E-04	7.3E-04	1.84E-02	pCi/g	66.90%	RICHRC5010	
. AM-241	2.70E-03	3.4E-02	3.4E-02	5.43E-02	pCi/g	N/A	RICHRC5017	
CO-60	1.89E-02	8.5E-03	8.7E-03	1.64E-02	pCi/g	N/A	RICHRC5017	
CS-137DA	-2.14E-03	6.6E-03	6.6E-03	1.11E-02	pCi/g	N/A	RICHRC5017	
EU-152	1.18E-02	1.7E-02	1.7E-02	2.93E-02	pCi/g	N/A	RICHRC5017	
EU-154	-4.45E-02	3.2E-02	3.3E-02	5.06E-02	pCi/g	N/A	RICHRC5017	
EU-155	-3.43E-03	2.1E-02	2.1E-02	3.33E-02	pCi/g	N/A	RICHRC5017	
K-40	1.63E+01	4.6E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017	
RA-224DA	2.08E-01	2.4E-02	3.2E-02	N/A	pCi/g	N/A	RICHRC5017	
RA-226DA	2.03E-01	2.8E-02	3.5E-02	N/A	pCi/g	N/A	RICHRC5017	
RA-228DA	2.45E-01	4.0E-02	4.7E-02	7.99E-02	pCi/g	N/A	RICHRC5017	
U-238	1.90E-01	2.7E-01	2.7E-01	4.46E-01	pCi/g	N/A	RICHRC5017	
STRONTIUM	1.57E-02	3.4E-02	3.5E-02	1.37E-01	pCi/g	94.20%	RICHRC5006	

Number of Results: 15

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc. 3350 George Washington Way Richland, WA 99352

August 20, 1997

Attention: Joan Kessner

SAF Number : B97-091
Date SDG Closed : July 29,1997
Number of Samples : Seven (7)
Sample Type : Soil
SDG Number : W01811
Data Deliverable : Summary



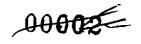
I. Introduction

On July 29, 1997, seven soil samples were received by the Quanterra Environmental Services Richland Laboratory (QESRL) for radiochemical and chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QESRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
70740801	B0K0F4	Soil	7/29/97
70740802	B0K0F5	Soil	7/29/97
70740803	B0K0F6	Soil	7/29/97
70740804	B0K0F7	Soil	7/29/97
70740805	B0K0F8	Soil	7/29/97
70740806	B0K0H0	Soil	7/29/97
70740807	B0K0H1	Soil	7/29/97

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.





Bechtel Hanford, Inc. August 20, 1997 Page 2

The requested analyses were:

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

Chemical Analyses

Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W01811 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results with the exception of the chemical analyses which are reported in mg/L.

IV. Comments

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010

Due to an oversight samples from SDGs W01809 and W01811 were batched together. The LCS, batch blank, sample and sample duplicate (B0K0N4) results are within contractual requirements.

Gamma Spectroscopy

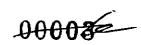
Gamma Scan by method RICH-RC-5017

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.





Bechtel Hanford, Inc. August 20, 1997 Page 3

Chemical Analysis

Chromium Hex by EPA method 7196

The original analysis of the samples was performed within the holding time. However, due to problems with the blank, the sample were reanalyzed outside holding time as per client direction. The matrix spike and matrix spike duplicate recoveries were low due to sample matrix interference. A post digestive spike was analyzed and its low recovery confirms the reducing effect of the sample. The LCS, batch blank, sample results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Jodie Carnes

Project Manager



Quanterra Incorporated 13715 Rider Trail North Earth City, Missouri 63045

314 298-8566 Telephone 314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated 3350 George Washington Way Richland, Washington 99352

August 15, 1997

Attention: Joan Kessner

Project number : 550.234

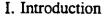
Date Received by Lab : July 29, 1997

Number of Samples : Seven (7)

Sample Type : Soil

SDG Number : W01811

Data Deliverable : Summary



On July 29, 1997, seven (7) soil samples were received by Quanterra, Richland and were transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client IDs:

St. Louis ID	BHI ID	Richland ID	Matrix	Date of Receipt
15452-001	B0K0F4	70740701	Soil	29-JUL-97
15452-002	B0K0F5	70740702	Soil	29-JUL-97
15452-003	B0K0F6	70740703	Soil	29-JUL-97
15452-004	B0K0F7	70740704	Soil	29-JUL-97
15452-005	BOKOF8	70740705	Soil	29-JUL-97
15452-006	B0K0H0	70740706	Soil	29-JUL-97
15452-007	B0K0H1	70740707	Soil	29-JUL-97

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: Pesticides and PCBs by EPA Method 8080. Lead by EPA Method 7421.



Bechtel Hanford Incorporated

August 15, 1997

Project Number: 550.234

SDG: W01811

Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate were performed per the protocol for each analyte in this SDG.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Shipping and Receiving

There were no variances associated with sample receipt.

Pesticides/PCBs

The samples were determined to be near 100% solids, therefore, the moisture correction is negligible.

Some of the compounds for each sample in this sample delivery group are reported at a higher detection limit due to PCB interference. The results are flagged with an 'X' qualifier.

Metals

The matrix spike recovery for lead in sample 15452-001 was 77.5%, the matrix spike duplicate recovery 92.8%. In accordance with our standard operating procedure the associated lead data was flagged with an "N".

000003



Bechtel Hanford Incorporated

August 15, 1997

Project Number: 550.234

SDG: W01811

Page 3

I certify that this Certificate of Analysis in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Wade H. Price Project Manager

e:\\price\$\hanford\550\20x\hanw1811.coa

Bechtel Hanfor	d Inc.	; CHA	AIN OF CUSTO	DY/SAM	IPLE A	NALYS	IS REQ	UEST			B97-091-16	Page	1 of 1
Collector Doug Br	zant.		Company Contact Duane Jacques	Tele 3	phone No. 72-9400		· ·	Project Co Koerner,			Data Turnarow 15 Days	ıd	
Project Designation 107-D-1 Trench – Confin	/		Sampling Location 100-DR-1	-		1		SAF No. B97-091					
Ice Chest No.			Fleld Logbook No.	-/30/				Method of Shipment Hand deliver					
Shipped To Quanterra			Offsite Property No.	1/1			<u> </u>	Bill of Ladi	ng/Air Bill I	No.			
POSSIBLE SAMPLE HAZ	ARDS/REMARKS		Preservation	None	Cool 4C	None	None	None	Cool 4C	None		-	
			Type of Container	G/P	a	G	a	a	aG.	SP	,		
			No. of Container(s)	1	1	1	1	1	ı	1			
Special Handling and/or St Cool to 4C	orage		Volume	20ml	60ml	60ml	60ml	60ml	120ml	1000ml			
		1	\sqrt{SDL}	Activity Scan	Chromium Hex - 7196	Isotopic Phutonium	Lead - 7421- (GFAA)	Strontium- 89,90 — Total Sr	Pest/PCBs - 8080 (TCL)	See item (1) in Special			
10	1140 T	ANALYSIS	SDC D018/1		107	408	ś	10/1408		NOTHOS			
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воког <u>02</u>	Soil	7-29-97	0840	×	>=	<u> </u>	~	_<	يد	×			
вокоғ 03	Soil	7-29-97	0855	×	<i>y</i> _	٧	بر	<	×	<			
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вокоғв 05	Soil	7-24-97	1010	<u> </u>	7	2	يح	عد	بعر				
		<u> </u>	·								 }-		
CHAIN OF POSSESSION	N	Sign/Print N	anjes		SPECIAL I	Spectroscopy (Cesium-137, C	Cobalt-60, Euro	pium-152, Eur	opium-154, Eu	ropium-155};	\$ - :	atrix ⁶ Soil Sediment
elinquished By Date/Time 1/35 Received By 7-29-97 Elinquished By Date/Time Received By			CIOCCOL DOTOLIO		Gama Spec	: - Add-oli (Ad	nericium-241, 1	olemen. 234 t				SL - :	Solid Sludge Water Oil Air Drum Solids
clinquished By Date/Time Received By			Date/Tir	Tie	DL - Dru T - Tise						Drum Liquids		
clinquished By Date/Time Received By			Date/Tir	ne			**					r - i	Liquid Vegetation Other
ABORATORY Received		Title	l. <u>.</u>					<u>"</u>	Date/Time				
NAL SAMPLE Digest Disposition	al Methuni	 			Disposed By	·				Date/Time			

Bechtel Han						MPLE ANALYSIS REQUEST B97-091-17						Page] of]		
Collector	Brynt			Company Contact Duane Jacques	Tele	phone No. 72-9400	•		Project Co- Koerner,			Data Turnaround	1		
Project Designation 107-D-1 Trench Co		<u>.</u>		Sampling Location 100-DR-1			1		SAF No. B97-091						
ice Chest No.				Field Logbook No. EL-130/					Method of Shipment Hand deliver						
Shipped To Quanterra				Olisite Property No.	1/2				<u> </u>	ng/Air Biii i	No.				
POSSIBLE SAMPLE	HAZARDS/REMA	RKS		Preservation	None	Cool 4C	None	None	Nona	Cool 4C	None	 			
				Type of Container	G/P	G	G	a	G	\$G	a A				
	·			No. of Container(s)	1	1	1	1	1	1	1				
Special Hundling and/o Cool to 4C	or Storage			Volume	20ml	60ml	60ml	60ml	60ml	120mi	1000ml				
	SAMPLE ANALYSIS				Activity Scan	Chromium Hex - 7196	Isotopie Plutonium	Lead - 7421 - (GFAA)	Strontium- 89,90 Total Sr	Pest/PCBs - 8080 (TCL)	See item (1) in Special Instructions.				
	107407					107	408		107408		101408				
Sample No.	Mat	rix *	Sample Date	Sample Time						i ya cara ya y hisio sanii h	rasionemico. Buille 2003	egy a trop change grow In 1995 to the second	eri samani Series (Series Series (Series	g garagaguag A sandan W	
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_ <u>~~</u>											<u> </u>				
				<u></u>											
CHAIN OF POSSESS	sion		Sign/Print N	Antes	l	SPECIAL I		ONS Cesium-137, C	obalt-60, Europ	oium-152, Euro	opium-154, Eu	ropium-155};	s - s	strix * Soil	
clinquished By Date/Time //3 > Keceived By Date Thus Broad 7-287-67				C100(Pr) Date/In	11.32	Gamma Spec	: - Add-on {An	nericium 241, t	Jranium-238}				SO - S SL - S W - S O - G	Solid Sludge Water Oil	
<u> </u>				Date/Tin									DL - 1 F - 7 MI - 1	Drum Liquids Tissue Wipe Liquid	
nd inquished By Date/Time Received By Date/Ti				ne								v - '	Vegetation Other		
ABORATORY Received By SECTION			Title				<u></u>			Date/Time					
A	isposal Method		<u></u>				Disposed By					Date/Time			

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	(0)	D	E	
PROJECT: 107-DI trench			DATA PACKAGE: WU[81]			
VALIDATOR: TL LAB: OF		is	DATE: 1 2	3/50		
CASE:			SDG: WUTAU			
ANALYSES PERFORMED						
□ CLP/ICP	☐ CLP/GFAA	□ CLP/Hg	☐ CLP/Cyanida		0	
□ SW-846/ICP	E 3W-846/GFAA	☐ SW-846/Hg	SW-846 Cyenide	The Her Chrone	0	
SAMPLES/MATE	RIX Soil					
BOKOF	4, BOKO	FS, BOK	OFL, BOK	CUFT, BO	kofy	
1	HO Bok	_				
Is technical	rrative preser	documentation	NARRATIVE n present? .	_	res No (Q)	
	olding times a		• • • • • •		Yes No N/A	
						

A-19 000035

WHC-SD-EN-SPP-002, Rev. 2

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS	\cap
Were initial calibrations performed on all instruments? Yes	No /(N/A)
Are initial calibrations acceptable? Yes	No N/A
Are ICP interference checks acceptable? Yes	No N/A
Were ICV and CCV checks performed on all instruments? Yes	No N/A
Are ICV and CCV checks acceptable? Yes	No N/A
Comments:	
4. BLANKS	· ·
Were ICB and CCB checks performed for all applicable analyses? Yes	No /N/A
Are ICB and CCB results acceptable? Yes	No W/A
Were preparation blanks analyzed?	No N/A
Are preparation blank results acceptable?	No N/A
Were field/trip blanks analyzed? (res)	No N/A
Are field/trip blank results acceptable? Yes	(No) N/A
Comments: HO + 1+1 beech have lead detector	
,	
	-
5. ACCURACY	
Were spike samples analyzed?	No N/A
Are spike sample recoveries acceptable?	No N/A
Were laboratory control samples (LCS) analyzed? Yes	No N/A
Are LCS recoveries acceptable? Yes	No (N/A
Comments:	
	
	· · · · ·
	

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION	
Were laboratory duplicates analyzed? Yes	No N/A
Are laboratory duplicate samples RPD values acceptable? Yes	No N/A
Were ICP serial dilution samples analyzed? Yes	No / N/A
Are ICP serial dilution %D values acceptable? Yes	No N/A
Are field duplicate RPD values acceptable? Yes (No N/A
Are field split RPD values acceptable? Yes	No (N/A)
Comments: RDP outule ac limit (lead)	
	·
7. FURNACE AA QUALITY CONTROL	
Were duplicate injections performed as required? Yes	No (N/A
Are duplicate injection %RSD values acceptable? Yes	No N/A
Were analytical spikes performed as required? Yes	No N/A
Are analytical spike recoveries acceptable? Yes	No N/A
Was MSA performed as required? Yes	No N/A
Are MSA results acceptable? Yes	No W/A
Comments:	
8. REPORTED RESULTS AND DETECTION LIMITS	
Are results reported for all requested analyses? Yes	No N/A
Are all results supported in the raw data? Yes	No (N/A)
Are results calculated properly? Yes	No (N/A)
Do results meet the CRDLs? Yes	No N/A
Comments:	
<u> </u>	

A-21/2 ()00037

Date:

25 November 1998

To:

Bechtel Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project: 107-D1 Trench - Confirmation

Subject: Pesticide/PCB - Data Package No. W01811-QES (SDG No. W01811)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. W01811-QES prepared by Quanterra Environmental Services (QES). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOKOF4	7/29/97	Soil	С	Pest/PCBs by EPA 8080
BOKOF5	7/29/97 .	Soil	С	Pest/PCBs by EPA 8080
BOKOF6	7/29/97	Soil	С	Pest/PCBs by EPA 8080
BOKOF7	7/29/97	Soil	С	Pest/PCBs by EPA 8080
BOKOF8	7/29/97	Soil	С	Pest/PCBs by EPA 8080
воконо	7/29/97	Soil	С	Pest/PCBs by EPA 8080
вокон1	7/29/97	Soil	С	Pest/PCBs by EPA 8080

Data validation was conducted in accordance with the BHI validation statement of work (BHI 1997) and the 100 Area Remedial Action Sampling and Analysis Plan (May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than the CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as nondetects and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as a nondetect, elevated to the CRQL and flagged "U".

All method blank target compound results were acceptable.

Field and Equipment Blanks

One equipment blank (BOKOH1) and one field blank (BOKOH0) were submitted for analysis. No analytes were detected in the field or equipment blank.

Accuracy

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate

analyses are performed in duplicate using six compounds and must be within the established laboratory quality control limits of 70-130 percent. If spike recoveries are outside control limits, detected sample results less than 5 times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate recovery results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Undetected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to the lack of a DCB surrogate analysis, all results in samples BOKOF6, BOKOF7, BOKOF8, BOKOHO and BOKOH1 were qualified as estimates and flagged "J".

All other surrogate recovery results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Results must be within RPD limits of \pm 0% for soil samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples were submitted to QES for analysis as shown below:

Sample No. Duplicate Sample No.

BOKOF7 BOKOF8

The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. The RPD for 4',4-DDT was outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

Detection Levels

Reported laboratory detection levels are compared against the target detection limits (TDLs) specified on page II-5 of the 100 Area Remedial Action Sampling and Analysis Plan to ensure that laboratory detection levels meet the required criteria. The reported analytical detection level were above the TDL for the following: toxaphene was above in all samples; endrin, endrosulfan II, 4,4'-DDD, endosulfan sulfate, 4,4'-DDT, methoxychlor, and endrin aldehyd were above in sample B0K0F5; arochlor-1242 was above in samples B0K0F5, B0K0F6, B0K0F7, and B0K0F8; arochlor-1254 in sample B0K0F5; and arochlor-1260 in samples B0K0F5, B0K0F6, B0K0F7 and B0K0F8. Under the BHI statement of work, no qualification is required. All other reported detection levels were at or below the TDL.

Completeness

Data Package No. W01811-QES (SDG No.W01811) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a DCB surrogate analysis, all results in samples BOK0F6, BOK0F7, BOK0F8, BOK0HO and BOK0H1 were qualified as estimates and flagged

"J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.
 The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W01811	REVIEWER: TLI	DATE: 11/25/98	PAGE_1_0F_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	BOKOF6, BOKOF7, BOKOF8, BOKOHO, BONOH1	No DCB surrogate analysis
			·
	·		

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Laborstory: Guartans SpG: W01911 Sample Number BOKOF4 BOKOF5 BOKOF6 BOKOF7 BOKOF8 BOKOF8 BOKOF8 BOKOH1									-										}			D	Project: BECHTEL-HANFOR
Semple Number BOKOF4 BOKOF5 BOKOF6 BOKOF7 BOKOF9 BOKOH0 BOKOH1 Semilar Semil																			1				Laboratory: Quanterra
Location A15,7,1 B110,13,15 C3,4,5,11 D3,4,8,13 Dylicate Field Blaw Equip Blate C7/29/97										<u>,</u>									<u> </u>		01811	SDG: W	Case
Remarks Sample Date O7/29/97 O7/29/9								COH1	воко		воконо		BOKOF8		BOKOF7		BOKOF6		BOKOF5		BOKOF4		Sample Number
Sample Date									<u> </u>		l				D3,4,8,13		C3,4,5,11		B1,10,13,15		A1,5,7,15		Location
Pest/PCB CRD Resilt Q				i.,			<u>k</u>	ip. Blan	Equip.	<u> </u>	Field Blank		Duplicate						L				Remarks
alpha-BHC 50 1.7 U 1.7								29/97	07/29		07/29/97		07/29/97		07/29/97		07/29/97	!	07/29/97		07/29/97		Sample Date
hete-BHC	sult Q	l Re	10	Result	٥	Result	_		+	0	Result	_		_				<u>a</u>	Result	<u>a</u>	Result	CRDL	Pest/PCB
delta-BHC 50 1.7 U 1.7 U 1.7 U 4.3 U 4.7 U 1.7 U			1_				_					-		Į				Ų.	1.7	_		50	alpha-BHC
Genoma-BHC (Lindane) 50 1.7 U 1.8			1				_					_		υJ	1.7			U	1.7	U	1.7	50	beta-BHC
Heptachlor			┸				บป	1.7	 	บม	1.7	UU	4.7	UJ.	4.3	υJ	1.7	U_	1.7	U	1.7	50	delta-BHC
Addin 50 1.7 U 7 U 2.6 UJ 8.6 UJ 9.4 UJ 1.7			1		_							บม	1.7	UJ	1.7			U	1.7	U	1.7	50	gamma-BHC (Lindane)
Heptachlor epoxide			1	<u></u> _										_		_		U	5.1	U	1.7	50	Heptachlor
Endosulfan I 50 1.7 U 1.		Д_	4_		Ш		_	$\overline{}$							_	-		U.	7	U	1.7	50	Aldrin
Dieldrin 50 1.7 U 4.7 U 1.7 UJ 4.4 · DE 50 1.7 U 3.7 U 1.7 UJ 1.7			\bot		Ш		_		+			+		_				U	3.2	υ	1.7	50	Heptachlor epoxide
4,4*-DDE 50 1.7 U 3.7 U 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.8 UJ 1.7 UJ 1.7 UJ 1.8 UJ			4		Ш							_		_		_		낕	1.7	Ī		50	Endosulfan I
Endrin 50 1.7 U 340 U 13 UJ 23 UJ 26 UJ 1.7			1				_							_		_		U	4.7	U	1.7	50	Dieldrin
Endosulfan II 50 1.7 U 170 U 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.8 UJ 1		-↓-	↓_		Ш		_				į	_		υJ	1.7	UJ	1.7	Ų.	3.7	U	1.7	50	4,4'-DDE
4.4'-DDD 50 1.7 U 170 U 1.7 UJ			丄		Щ		_											U	340	U	1.7	50	Endrin
Endosulfan sulfate 50 1.7 U 170 U 2.9 UJ 4.2 UJ 4.6 UJ 1.7		—	↓_		Щ		_		+									U_	170	U_	1.7	50	Endosulfan II
4.4'-DDT 50 1.7 U 1000 U 14 UJ 49 UJ 29 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 1.7 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 3.3 UJ 1.7 UJ <		-↓-	┷				UJ.	_1.7	<u>↓</u>	-				υJ	1.7	υJ	1.7	낕	170	ט	1.7	50	4,4'-DDD
Methoxychlor 50 3.3 U 590 U 5.5 UJ 10 UJ 12 UJ 3.3 UJ 1.7	——↓	-↓-	4		\Box		_		└									U.	170	Ų	1.7	50	Endosulfan sulfate
Endrin Aldehyde 50 1.7 U 720 U 8.4 UJ 14 UJ 15 UJ 1.7 UJ 1		┵	┺						ـــ					1		กา	14	U	1000	U	1.7	50	4,4'-DDT
Tech. Chlordene 50 17 U 17 U 17 U 17 UJ 17			↓_		\Box		_		<u> </u>											υ	3.3	50	Methoxychlor
Toxaphene 50 67 U 67 U 67 UJ 33 UJ		→	┸						<u> </u>			+		_				U	720	υ	1.7	50	Endrin Aldehyde
Aroclor-1221 50 33 U 33 U 33 UJ <			┶						<u>↓</u>	บป	17	lη	17	1	-	บม	17	U	17	Ü	17	50	Tech. Chlordane
Aroclor-1232 50 33 U 33 U 33 UJ <			╀-				,		↓ _			-		_				U	67	U	67	50	Toxaphene
Aroclor-1242 50 33 U 130 U 69 UJ 380 UJ 400 UJ 33 UJ 33 UJ 33 UJ Aroclor-1016 50 33 U 33 U 33 UJ			4						<u> </u>	เกา	33	บม	33	UJ	33	υJ	33	υ	33	U	33	50	Aroclor-1221
Aroclor-1248 50 33 U 33 U 33 UJ <		4-	4		Ш				<u> </u>	—				UJ.	33			Ų	33	٥	33	50	Aroclos-1232
Aroclor-1248 50 33 U 33 U 33 UJ 33 U		-4	4		Ш		_		<u> </u>			4						U	130	_		50	Aroclor-1242
Aroclor-1254 50 33 U 3300 U 33 UJ 33 UJ 33 UJ 33 UJ 33 UJ			\bot				_		!	-		-		1				U	33	U	33	50	Aroclor-1016
Model 1894		-	丄				_		<u> </u>	+		-		UJ	33	υJ	33	U	33	U	33	50	Aroclor-1248
Arocior-1260 50 33 U 47000 330 J 580 J 640 J 33 UJ 33 UJ			丄	<u></u>	_			_		ทา	33	υJ	33	UJ	33	υJ	33	U	3300	U	33	50	Aroclor-1254
			丄	l	<u> </u>		บป	33	<u> </u>	υJ	33	J.	640	7	580	J_	330		47000	U	33	50	Aroclor-1260
		┵	1	<u> </u>					<u></u>	上		ٺــــــا	<u></u> _	_	L								
▙▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄ ▄ ▄ ▄▄▄▄▄▄▄▄▄			\perp]]			L	$oldsymbol{ol}}}}}}}}}}}}}}}}$											
									L										1				
		ユ	\perp																1				

1D PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: <u>OUANTERRA.MO</u> Contract:	550-234 BOK0F5
Lab Code: ITMO Case No.: S	
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID:15452-002
Sample wt/vol:30.2_(g/ml)G	Lab File ID:
Level: (low/med) LOW	Date Sampled :07-29-97
% Moisture: not dec dec	Date Extracted: 08-01-97
Extraction: (SepF/Cont/Sonc) SONC	<u> </u>
GPC Cleanup: (Y/N) N pH:	Dilution Factor: 1.0
CAS NO. Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q
319-84-6	5.1 UX 7.0 UX 3.2 UX 1.7 U 4.7 UX 3.7 UX 3.7 UX 340 UX* 170 U* 170 U* 170 U* 170 UX
11097-57-4Aroclor-1254 11096-82-5Aroclor-1260	3300 U* 47000 *

Χ:

Elevated detection limit due to PCB interference. Reported from a 100X dilution on 08-14-97. Reported from a straight run on 08-14-97. Concentration of analyte is less than the value given. *: **:

U:

FORM I PEST

1/87 Rev.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ab Name: <u>OUANTERRA,MO</u> Contract:	BOK0F4	
ab Code: ITMO Case No.:	SAS No.: SDG No.:W01811	
atrix: (soil/water)SOIL	Lab Sample ID:15452-0	01
ample wt/vol: <u>30.1</u> (g/ml) <u>G</u>	Lab File ID:	
evel: (low/med)LOW	Date Sampled :07-29-9	7
Moisture: not dec0 dec	Date Extracted: 08-01-97	<u>, </u>
traction: (SepF/Cont/Sonc) SONC	Date Analyzed: 08-13-97	<u>, </u>
C Cleanup: (Y/N) N pH:	Dilution Factor: 1.0	
CAS NO. Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
319-84-6	1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	0 0 0 0 0 0 0 0 0 0 0 0
72-54-84,4'-DDD 1031-07-8Endosulfan sulfate 50-29-34,4'-DDT 72-43-5Methoxychlor 53494-70-5Endrin Aldehyde 57-74-9Tech. Chlordane 8001-35-2Toxaphene 11104-28-2Aroclor-1221 11141-28-2Aroclor-1232 53469-21-9Aroclor-1242 12674-11-2	1.7 3.3 1.7 17 67 33 33 33 33 33 33	0 0 0 0 0 0 0 0
11097-57-4	33 33 33 33 33 33 33 33 33 33 33 33 33	

FORM I PEST

1/87 Rev.

11/25/97 -000025

1D PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: <u>QUANTERRA,MO</u> Contract:	550-234	BOK0F6
Lab Code: ITMO Case No.: SAS No.:		W01811
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID:	
Sample wt/vol:30.2 (g/ml)G	Lab File ID:	
Level: (low/med) LOW	Date Sampled :	07-29-97
% Moisture: not dec dec	Date Extracted:	08-01-97
Extraction: (SepF/Cont/Sonc) SONC	Date Analyzed:	08-13-97
GPC Cleanup: (Y/N) N pH:	Dilution Factor:_	1.0
	TRATION UNITS: or ug/Kg) <u>UG/KG</u>	<u> </u>
319-84-6	1.7 1.7 1.7 2.3 2.6 1.7 1.7 1.7 1.7 1.7 1.7	

X: Elevated detection limit due to PCB interference.

**:

Reported from a straight run on 08-14-97.

Concentration of analyte is less than the value given.

FORM I PEST U:

1/87 Rev.

1/2/9×

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: OUANTERRA,MO Contract: 550-234	BOK0F7
Lab Code: ITMO Case No.: SAS No.:	
·	le ID: <u>15452-004</u>
Sample wt/vol: 30.3 (g/ml) G Lab File	ID:
Level: (low/med) LOW Date Samp	pled : <u>07-29-97</u>
% Moisture: not dec Date Extr	racted: 08-01-97
Extraction: (SepF/Cont/Sonc) SONC Date Anal	lyzed: <u>08-13-97</u>
GPC Cleanup: (Y/N) N pH: Dilution	Factor: 1.0
CONCENTRATION UP CAS NO. Compound (ug/L or ug/Kg)	
72-55-9	4.3 UX 1.7 U 10 UX 8.6 UX 3.0 UX 1.7 U 1.7 U 1.7 U 1.7 U
11000 02-31-1-1-1200	

Х:

**;

Elevated detection limit due to PCB interference. Reported from a straight run on 08-14-97. Concentration of analyte is less than the value given. U: FORM I PEST

1/87 Rev.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ab Name: <u>OUANTERRA.MO</u> Contract	: 550-234	BOKOF8
ab Code: ITMO Case No.:		W01811
Matrix: (soil/water) <u>SOIL</u>	Lab Sample ID:	15452-005
Sample wt/vol:30.0 (g/ml)G	Lab File ID:	
evel: (low/med) LOW	Date Sampled :	07-29-97
Moisture: not dec. 1 dec.	Date Extracted:	08-01-97
Extraction: (SepF/Cont/Sonc)	SONC Date Analyzed:	08-13-97
GPC Cleanup: (Y/N) N pH:	Dilution Factor:	1.0
CAS NO. Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	0
319-84-6	1.7 4.7 1.7 1.7 1.7 1.7 2.6 1.7 2.6 1.7 2.6 1.7 2.6 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7	UX UX UX UX UX UX UX UX U U U U U U U U

Elevated detection limit due to PCB interference. **X**:

**: Reported from a straight run on 08-14-97.

ប: Concentration of analyte is less than the value given. FORM I PEST

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1D PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

		воконо
ab Name: <u>OUANTERRA, MO</u> Contract:	550-234	I
ab Code: ITMO Case No.: SAS No.	: SDG No.:	W01811
atrix: (soil/water)SOIL	Lab Sample ID:	15452-006
ample wt/vol:30.1_(g/ml)G	Lab File ID:	
evel: (low/med) LOW	Date Sampled :	07-29-97
Moisture: not dec. 0 dec	Date Extracted:	08-01-97
extraction: (SepF/Cont/Sonc) SONC	Date Analyzed:	08-13-97
PC Cleanup: (Y/N) N pH:	Dilution Factor:_	1.0
	NTRATION UNITS: or ug/Kg) <u>UG/KG</u>	Q
319-84-6alpha-BHC 319-85-7beta-BHC 319-86-8delta-BHC		U
58-89-9	1:7	<u> </u>
1024-57-3Heptachlor epoxide 959-98-8Endosulfan I	1.7	
60-57-1Dieldrin	1.7	<u> </u>
72-20-8Endrin 33213-65-9Endosulfan II	1.7	
72-54-84,4'-DDD 1031-07-8Endosulfan sulfate 50-29-34,4'-DDT	1.7	
72-43-5	3.3	<u> </u>
57-74-9Tech. Chlordane	17	U U
11104-28-2	33	U U
53469-21-9	33	U U
12672-29-6Aroclor-1248 11097-57-4Aroclor-1254	33	
11096-82-5Aroclor-1260	33	

FORM I PEST

pu 11/25/48

1/87 Rev.

1D PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA.MO Contract: 550-234 Lab Code: ITMO Case No.: SAS No.: SDG No.: W01811 Matrix: (soil/water) SQIL Lab Sample ID: 15452-007 Sample wt/vol: 30.1 (g/ml) G Lab File ID: Level: (low/med) LOW Date Sampled: 07-29-97 Moisture: not dec. 0 dec. Date Extracted: 08-01-97 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97 GPC Cleanup: (Y/N) N PH: Dilution Factor: 1.0 CONCENTRATION UNITS: CAS NO. Compound (ug/L or ug/Kg) UG/KG Q 319-84-6	
Sample wt/vol: 30.1 (g/ml) G Lab File ID: Level: (low/med) LOW Date Sampled: 07-29-97 % Moisture: not dec. 0 dec. Date Extracted: 08-01-97 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97 GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG 319-84-6	
Level: (low/med) Low Date Sampled: 07-29-97 4 Moisture: not dec. 0 dec. Date Extracted: 08-01-97 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97 GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0 CONCENTRATION UNITS: CAS NO. Compound (ug/L or ug/Kg) UG/KG Qug/KG 319-84-6	
# Moisture: not dec. 0 dec. Date Extracted: 08-01-97 Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97 GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG QUG/KG	
Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97 SPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG Q 319-84-6	
CONCENTRATION UNITS: CAS NO. Compound (ug/L or ug/Kg) UG/KG Q 319-84-6	
CAS NO. Compound (ug/L or ug/Kg) UG/KG Q 319-84-6	 -
CAS NO. Compound (ug/L or ug/Kg) UG/KG Q 319-84-6	
319-86-8)
53494-70-5	

20003k

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Quanterra Incorporated 13715 Rider Trail North Earth City, Missouri 63045

314 298-8566 Telephone 314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated 3350 George Washington Way Richland, Washington 99352

August 15, 1997

Attention: Joan Kessner

Project number : 550.234

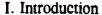
Date Received by Lab : July 29, 1997

Number of Samples : Seven (7)

Sample Type : Soil

SDG Number : W01811

Data Deliverable : Summary



On July 29, 1997, seven (7) soil samples were received by Quanterra, Richland and were transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client IDs:

St. Louis ID	BHI ID	Richland ID	Matrix	Date of Receipt
15452-001	B0K0F4	70740701	Soil	29-JUL-97
15452-002	B0K0F5	70740702	Soil	29-JUL-97
15452-003	B0K0F6	70740703	Soil	29-JUL-97
15452-004	B0K0F7	70740704	Soil	29-JUL-97
15452-005	B0K0F8	70740705	Soil	29-JUL-97
15452-006	B0K0H0	70740706	Soil	29-JUL-97
15452-007	B0K0H1	70740707	Soil	29-J UL-97

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: Pesticides and PCBs by EPA Method 8080. Lead by EPA Method 7421.



Bechtel Hanford Incorporated August 15, 1997

Project Number: 550.234

SDG: W01811

Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate were performed per the protocol for each analyte in this SDG.

IV Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Shipping and Receiving

There were no variances associated with sample receipt.

Pesticides/PCBs

The samples were determined to be near 100% solids, therefore, the moisture correction is negligible.

Some of the compounds for each sample in this sample delivery group are reported at a higher detection limit due to PCB interference. The results are flagged with an 'X' qualifier.

Metals

The matrix spike recovery for lead in sample 15452-001 was 77.5%, the matrix spike duplicate recovery 92.8%. In accordance with our standard operating procedure the associated lead data was flagged with an "N".

20003



Bechtel Hanford Incorporated

August 15, 1997

Project Number: 550.234

SDG: W01811

Page 3

I certify that this Certificate of Analysis in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Project Manager

e:\\price\$\hanford\550\20x\hanw1811.coa

Bechtel Hanford	Inc.	CHA	AIN OF CUSTO	DY/SAM	IPLE A	NALYS	IS REQ	UEST			B97-091-16	Page	1 of 1
Collector			Company Contact Duane Jacques	Tele	phone No. 72-9400	·		Project Co Koemer,			Data Turnaroun 15 Days	.d	
Project Designation 107-D-1 Trench - Confirmation			Sampling Location 100-DR-1		72 7 100	,		SAF No. B97-091			13 0434		
ice Chest No.			Field Logbook No.	-/ 35 4				Method of Hand del	Shipment				
Shipped To Quanterra			Offsite Property No.	-/30/				Bill of Ladi	ng/Air Bill	No.	·		
POSSIBLE SAMPLE HAZAR	RDS/REMARKS			None	Cool 4C	None	None	None	Cool4C	None			<u> </u>
			Preservation	G/P	G	G	0	g	a.G	Jap .	 		
			Type of Container	 	 			 	 	DLA	 -		
Special Handling and/or Stora	Ec		No. of Container(s) Volume	20ml	60ml	60ml	60ml	60ml	120ml	1000ml	 -		
Cool to 4C				Activity Scan	Chromium Hex - 7196	Isotopic Phatoman	Lead - 7421 - (GFAA)	Strontium- 89,90 - Total	Pest/PCBs - \$080 (TCL)	See item (1) in Special		·	ļ
000023	SAMPLE AT	nalysis	SDL W01811		107	408	(372)	101408		NOTHOS			
Sample No.	Matrix *	Sample Date	Sample Time	The in the Sain	Kir Shi Manin	and the second			ar y go sa ca ca Lo. La casa La ca	napranjeni sie o 1 julija – 1 12 julija – 1	The second second		and opposite
BOKOF4 01	Soil	7-29-97	0825	*	*	*	У.	×	入	×			
воког 02	Soil	7-29-9-7	0840	×	>4	¥	×	<	بد	×			
вокоге 03	Soil	7-29-97	0855	X	×	ĸ	ير	<	ير	_ <			
вокогт 04	Soil	7-29-97	1005	~	K	×	×	7	×	_ <			
вокоғв 05	Soll	7-24-92	1010	_ <	7	2	سر	34-	ير	<u>×</u>			
			<u> </u>	ļ	ļ		 -	<u> </u>	 				<u> </u>
		<u> </u>		<u> </u>	CDPCTAL I	INSTRUCT	IONS	<u></u>	<u> </u>	<u> </u>	┸╾╌┵┰		atrix *
CHAIN OF POSSESSION		Sign/Print N			(1) Gamma	Spectroscopy	(Cesium-137, C	Cobalt-60, Euro	pium-152, Eur	opium-154, Eu	ropium-155};	S - :	Soil Sediment
celinquished By Lelinquished By	Date/Time 1/3 7-29-97 Date/Time	Received By Received By	CIOCLON DATE/TH	1125	Gamma Spe	c - Add-on (Ai	nencium-241, i	Uranjum-298}				SL - : W - : O - : A - :	Solid Sludge Water Oil Air
clinquished By	Date/Fime	Received By	Detc/Tir	Me	1						}	DL - 1	Drum Solids Drum Liquids Tissue Wipe
elinquished By	Date/Time	Received By	Date/Tir	пе								V - '	Liquid Vegetation Other
LABORATORY Received By SECTION	'			Title							Date/Time		
ANAL SAMPLE Disposed to	1ciluni			···		Disposed B	y				Date/Time		

Bechtel Hanford	Inc.	СНА	AIN OF CUSTO	DY/SAN	IPLE A	NALYS	IS REQ	UEST			B97-091-1	7 Page] of]
Collector Doug Bry	n-+		Company Contact Duane Jacques		phone No. 72-9400		 -	Project Co Koemer,			Data Turnarou 15 Days	nd	
Project Designation 107-D-1 Trench Confirmation			Sampling Location 100-DR-1				····	SAF Na. B97-091					
Ice Chest No.			Fleid Logbook No.	(30/				Method of Shipment Hand deliver					
Shipped To Quanterra			EL - Offsite Property No.	IA				BIII of Lad	ing/Air Bill	No.			
POSSIBLE SAMPLE HAZAR	DS/REMARKS		Preservation	None	Cool 4C	None	None	None	Cool 4C	None			T
			Type of Container	G/P	G	G	a	G	aG	a A			1
			No. of Container(s)	1	1	1	ì	I	1	ì			
Special Handling and/or Stora [20] to 4C	ge		Volume	20ml	60m)	60ml	60ml	60ml	120ml	1000ml			
00024	SAMPLE AN	ALYSIS		Activity Scan	Chromium Hex - 7196	Esotopic Plutonium	Lead - 7421- (GFAA)	Strontium- 89,90 - Total Sr	Pest/PCBs - 8080 (TCL)	See item (1) in Special Instructions.			
24 10	17404				ויטףן	400	1	Nother		101400	•		
Sample No.	Matrix *	Sample Date	Sample Time	Calibration .	indistribution l	a de la desarta de la desarta de la desarta de la decembra de la decembra de la decembra de la decembra de la d	lo aski sir	gangganggan Katabungan	them with the	i ya an an an an Musiki Sasara	agagagagagagagagagagagagagagagagagagag	ing tang Sissing	a granica siya minisi sadad w
воконо СС	Soil	7-29.90	09115	1			~		<u>~</u>	У.			
вокон1 017	Soil	7-24-97	0925	×	L	*	٨.	<u>y</u> .	<u>×</u>	×			ļ
BOROH5	Soil	·			 	<u> </u>	 	} }		 			
			<u> </u>		ļ	 					 -		
				 -			<u> </u>	<u> </u>			 		
	-			 		 -					1		
CHAIN OF POSSESSION		Sign/Print N	ames		(1) Gamma	NSTRUCT		Cobalt-60, Euro	pium-152, Eur	opium-154, Eu	ropium-155};	SE -	fatrix * Soil Sedunant Solid
Charles Brown Caling wheel by Caling wheel by	Date/Time // 3) 7-2-9	Received By	Date/Tir	1135 me	(Janena Spe	r - vaa on fan	,	Manual 230				Si W - O - A -	Studge Water Oil Air Drum Solids
(clinquished By	Date/Time	Received By	Date/Tir				••					DL - T - WI -	Drum Liquids Tissue Wipe Liquid
Indicated By	Date/Time	Received By	Date/Tir	ne						<u></u>		× -	Vegetation Other
ABORATORY Received By SECTION				Title					•		Date/Time		
FINAL SAMPLE Disposel M	cthyxl					Disposed By					Date/Time		

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	Α	В	C	D	E
PROJECT: 100	DW + (BM)	rench LEE	DATA PACKAGE	: WO 1811	
VALIDATOR:	tL1	LAB: QES		DATE: 11/17	98
CASE:			SDG: WOIS	1/	
		ANALYSES	PERFORMED		
☐ CLP3/90	'X SW-846 8080	□ SW-846 8081			0
SAMPLES/MATE	RIX 😾 Soi				
BOKOFY	BOKOFS, B	OKOFL BO	OKOFT, BOI	cof8, Boko	HO, BOKOHI
	<u> </u>			<u>'</u>	· · ·
		- <u>-</u>			
,				<u></u>	
· F8 dup	HO-F5 HI	-£05			
	verification		•		es No N/A
2. HOLDING	rimes	·			
	olding times a				res No N/A
3. INSTRUMEN	IT PERFORMANCE		rions .		
	NT PERFORMANC	-	-		
	ntion times ac				4
	ion standard r endrin breakdo				Y
-		acceptan			

A5/3000026

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? Yes	No N/A
Is the GC/MS tuning/performance check acceptable? Yes	No N/A
Comments:	$\underline{}$
• .	
· ·	
3.2 CALIBRATIONS (METHOD 8080 AND 8081)	
Are EVAL standard calibration factors and %RSD values acceptable? Yes	No / N/A
Are quantitation column calibration factor %RSD values acceptable? Yes	No N/A
Were the analytical sequence requirements met? Yes	No N/A
Are continuing calibration %D values acceptable? Yes	No N/A
Comments:	
3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)	_
Was the initial calibration sequence performed? Yes	No N/A
Was the resolution acceptable in the resolution check mix? Yes	No N/A
Is resolution acceptable in the PEM, INDA and INDB? Yes	No N/A
Are DDT and Endrin breakdowns acceptable? Yes	No N/A
Are retention times in PEMs and calibration mixes acceptable? . Yes	No N/A
Are RPD values in the PEMs acceptable? Yes	No N/A
Are %RSD values acceptable? Yes	No N/A
Comments:	\checkmark
3.4 CALIBRATION VERIFICATION (3/90 SOW)	
Were the analytical sequence requirements met? Yes	No (N/A)
Is resolution acceptable in the PEMs? Yes	No N/A
Are initial calibrations acceptable? Yes	No N/A

A6/400027

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs, INDA and INDB mixes? Yes	No	N/A
Are RPD values in the PEMs acceptable? Yes	No	N/A
Are the DDT and endrin breakdowns acceptable? Yes	No	N/A
Was GPC cleanup performed? Yes	No	N/A
Is the GPC calibration check acceptable? Yes	No	N/A
Was Florisil cleanup performed? Yes	No	N/A
Is the Florisil performance check acceptable? Yes	No	N/A
Comments:		W
Commenter &		
	<u> </u>	
a DIANUC		
4. BLANKS	M.	NI /A
Were laboratory blanks analyzed?	No	N/A
Are laboratory blank results acceptable?	No	N/A
Were field/trip blanks analyzed? Yes	No	N/A
Are field/trip blank results acceptable? Yes	No	N/A
Comments:		
5. ACCURACY		١.
Were surrogates analyzed? Yes	(No) N/A
Are surrogate recoveries acceptable? Yes	No	N/A
Were MS/MSD samples analyzed? Yes	No	N/A
Are MS/MSD results acceptable? Yes	No	N/A
Were LCS samples analyzed? Yes	No	(N/A
Are LCS results acceptable? Yes	No	\N/\$\
Comments:		
44-DDT MS 147 MSD 154		
Surrogat > No DCB FC-HI		

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION					1	5		
Are MS/MSD RPD values acceptable?	•		•	•	. 4	(es)	No	N/A
Are laboratory duplicate results acceptable?	•		•	•	. 1	es (No	(N/A)
Are field duplicate RPD values acceptable?			•	•	. 1	'es	(No)	N/A
Are field split RPD values acceptable?	•		•	•	. 1	'es	No	(N/A)
Comments: 4,4-DPT ontal actions								
				-				
7. SYSTEM PERFORMANCE						•		$\overline{\bigcirc}$
Is chromatographic performance acceptable?	•	•	•	•	. '	Yes	No	(N/A)
Are positive results resolved acceptably? Comments:	•	•	•	•	. 1	Yes	No	N/A
8. COMPOUND IDENTIFICATION AND QUANTITATION Is compound identification acceptable?						Yes	No	/N/A
Is compound quantitation acceptable?							No 	N/A
	-		· ·					
9. REPORTED RESULTS AND QUANTITATION LIMITS								
Are results reported for all requested analyses? .		•			.(Yes) No	N/A
Are all results supported in the raw data?	•	•			•	Yes	No	N/A
Do results meet the CRQLs?	•	•	• •		•	Yes	No) N/A
Comments:								

SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: <u>OUANTERRA, MO</u>	Contract: 550-234
Lab Code: ITMO Case No :	CAC No . SDC No · W01871

	EPA	S1.	S2
	SAMPLE NO.	(DCB)#	(TCMX)#

01	PBLK01	114	85
02	PSPK01	116	86
03	BOKOF4	_109	86
04	BOKOF4MS	109	85
05	BOKOF4MSD	105	82
06	BOKOF5	176	81
07	BOKOF6		83
08	BOKOF7		83
09	BOKOF8		84
10	воконо	,	85
11	BOKOH1		83
12			
13			
14		(
15		{	
16		1	

S1 (DCB) = Decachlorobiphenyl (10-264)
S2 (TCMX) = Tetrachlorom-m-xylene (32-152)

- # Column to be used to flag recovery values
- * Values outside of QC limits
- D Surrogates diluted out

page 1 of 1 FORM II PEST-1

1/87 Rev.

000027

Date:

25 November 1998

To:

Bechtel Hanford, Inc. (technical representative)

From:

TechLaw, Inc.

Project:

107-D1 Trench - Confirmation

Subject: Radiochemistry - Data Package No. W01811-QES (SDG No.

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. W01811-QES which was prepared by Quanterra Environmental Services (QES). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	aibeM	Validation	Analysis
BOKOF4	7/29/97	Soil	С	See note 1
BOKOF5	7/29/97	Soil	С	See note 1
BOKOF6	7/29/97	Soil	С	See note 1
BOKOF7	7/29/97	Soil	С	See note 1
BOKOFB	7/29/97	Soil	С	See note 1
воконо	7/29/97	Soil	С	See note 1
вокон1	7/29/97	Soil	С	See note 1

^{1 -} Gamma spectroscopy; isotopic plutonium; strontium-90.

Data validation was conducted in accordance with the BHI validation statement of work (BHI 1997) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL 1998). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

Blanks

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are elevated to the MDA and qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

Due to positive laboratory blank detection, radium-224 and radium-226 results in all samples were qualified as estimates and flagged "J".

All other blank results were acceptable.

Field and Equipment Blanks

One equipment blank (BOKOH1) and one field blank (BOKOH0) were submitted for analysis. Potassium-40, radium-224, radium-226, and radium-228 were detected in the field blank. Potassium-40, cobalt-60, radium-224, radium-226, and radium-228 were detected in the equipment blank. Under the BHI statement of work, no qualification was required. No other analytes were detected in the field or equipment blank.

Accuracy

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is 3 sigma. In addition, samples may be spiked with a radiochemical tracer to assist in

isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS analysis, all plutonium-238 and americium-241 results were qualified as estimates and flagged "J".

Due to an LCS recovery of 147%, all detected uranium-238 (GEA) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Precision

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than or equal to 30 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOKOF7/BOKOF8) were submitted to QES for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

Detection Levels

Reported laboratory detection levels are reviewed to ensure that they are at or below the limits listed in page II-5 of the 100 Area Remedial Action Sampling and Analysis Plan. All reported MDAs were at or below the analyte-specific limits.

Completeness

Data Package No. W01811-QES was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to positive laboratory blank detection, radium-224 and radium-226 results in all samples were qualified as estimates and flagged "J". Due to the lack of an LCS analysis, all plutonium-238 and americium-241 results were qualified as estimates and flagged "J". Due to an LCS recovery of 147%, all detected uranium-238 (GEA) results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W01811	REVIEWER: TLI	DATE: 11/25/98	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Plutonium-238 and Americium-241	J	All	No LCS analysis
Radium-224 and Radium- 226	J	All	Blank contamination
Uranium-238	J	BOKOF4, BOKOF5, BOKOF6, BOKOF7, BOKOF8	LCS percent recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANF	ORD]									•									
Laboratory: Quanterra			_	1																		
Case	SDG: W	/01811		1								,										
Sample Number		BOKOF4		BOKOF5		BOKOF6		BOKOF7		BOKOF8		воконо		вокон1	\Box		T					
Location		A1,5,7,15		B1,10,13,1		C3,4,5,11		D3,4,8,13		Duplicate		Field Blank		Equip, Blank	 		 -		 			
Remarks		<u> </u>								 - 							 		 		 	
Sample Date	-	07/29/97		07/29/97		07/29/97		07/29/97	_	07/29/97		07/29/97		07/29/97	† -		 		 			
Radiochemistry	CRDL	Rosult	a	Result	a	Result	a	Result	a	Result	a	Result	a_		Result	a	Result	la	Result	Tα	Result	Tα
Plutonium-238	0.1	0.00621	นม	0.00577	IJ	-0.000776	เกา	-0.000905	υĴ	-0.0012	UJ	0	UJ	0.00347 UJ		1=	\	†=		╅═╴	119501	+
Plutonium-239/240	0.1	0.00751	U	0.0248	U	0.0066	U	0.0321	U	0.0351	U	-0.000851	Ū.	-0.000365 U		厂		†-		- -	 	+
Americium-241	0.1	0.032	เกา	-0.0148	υJ	0.00389	เกา	0.059	7	0.0054	UJ	-0.0138	UJ	0.0027 UJ	ļ ———		 -	+-		$\forall -$		_
Cobalt-60	0.05	0.0194		0.00621	U	-0,00223	U	0.0334		0.0302		0.00953	U	0.0189		1		 	i	╁~		1
Cesium-137DA	0.05	0.0479		0.00925	U	0.029		0.201		0.174	Ī	0.00461	U	-0.00214 U		1		 		\top		+-
Europium-152	0.1	0.0521		0.0161	Ü	0.0458		0.374		0.332		0.00822	ט	0.0118 U		1		1-		┪~		_
Europium-154	0.1	0.00127	U	-0.00857	حا	0.0221	υ	0.0451	٥	0.00762	U	-0.00125	U	-0.0445 U	 			 		+-		1-
Europium-155	0.05	0.0192	U	0.039	حا	0.031	دا	0.0396	J	0.0318	U	0.0238 (5	-0.00343 U				 		+-		+-
Potassium-40		10.2		11.3		9.34		10.7		9.8		16.1		16.3	-	1		† 		+-		+-
Radium-224		0.525	J	0.621	J	0.477	J	0.557	J	0.511	J	0.226	ı	0.208 J	-	_				 		 -
Radium-226		0.406	J_	0.478	J	0.391	J	0.465	J	0.398	7	0.198	,	0.203 J			<u> </u>			1		+-
Redium-228		0,502	П	0.657		0.506		0.571		0.515		0.203	\neg	0.245				1-1		1		+
Uranium-238(GEA)		0.663	7	0.174	J	0.523	J	0.84	J	0.626	_	1.14 (Л	0.19 U						1		+-
Strontium	1	0.0722	Ü	0.0479	U	0.0463	υ	0.237		0.304		0.0266 L	,	0.0157 U	_							7
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LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740801

MATRIX:

SOIL

CLIENT ID:

B0K0F4

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
 HEXCHROME	3.00E-02	N/A	N/A	3:00E-02	mg/kg	N/A	EPA7196
PU-238	6.21E-03	1.6E-02	1.7E-02	4.07E-02	pCi/g	37.40%	RICHRC5010 T
PU239/40	7.51E-03	1.6E-02	1.6E-02	3.28E-02	pCi/g	37.40%	RICHRC5010
AM-241	3.20E-02	3.4E-02	3.4E-02	5.63E-02	pCi/g	N/A	RICHRC5017
CO-60	1.94E-02	8.3E-03	8.5E-03	1.63E-02	pCi/g	N/A	RICHRC5017
CS-137DA	4.79E-02	2.0E-02	2.1E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	5.21E-02	2.2E-02	2.3E-02	3.89E-02	pCi/g	N/A	RICHRC5017
EU-154	1.27E-03	2.8E-02	2.8E-02	4.83E-02	pCi/g	N/A	RICHRC5017
EU-155	1.92E-02	2.6E-02	2.6E-02	4.08E-02	pCi/g	N/A	RICHRC5017
K-40	1.02E+01	4.0E-01	1.1E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.25E-01	2.5E-02	5.8E-02	N/A	pCi/g	N/A	RICHRC5017 T
RA-226DA	4.06E-01	3.2E-02	5.2E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	5.02E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.63E-01	2.9E-01	3.0E-01	4.92E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	7.22E-02	3.7E-02	4.6E-02	1.13E-01	pCi/g	92.20%	RICHRC5006

Number of Results: 15

Die 11/25/25



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740802

MATRIX:

SOIL

CLIENT ID:

B0K0F5

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E 02	N/A	N/A	3:00E-02	-mg/kg	N/A	EPA7190
PU-238	5.77E-03	1.7E-02	1.7E-02	4.53E-02	pCi/g	37.40%	RICHRC5010
PU239/40	2.48E-02	2.9E-02	3.0E-02	3.41E-02	pCi/g	37.40%	RICHRC5010
AM-241	-1.48E-02	3.2E-02	3.2E-02	5.15E-02	pCi/g	N/A	RICHRC5017
CO-60	6.21E-03	9.6E-03 ⁻	9.6E-03	1.70E-02	pCi/g	N/A	RICHRC5017
CS-137DA	9.25E-03	8.4E-03	8.5E-03	1.47E-02	pCi/g	N/A	RICHRC5017
EU-152	1.61E-02	2.0E-02	2.0E-02	3.49E-02	pCi/g	N/A	RICHRC5017
EU-154	-8.57E-03	3.1E-02	3.1E-02	5.07E-02	pCi/g	N/A	RICHRC5017
EU-155	3.90E-02	2.5E-02	2.6E-02	4.12E-02	pCi/g	N/A	RICHRC5017
K-40	1.13E+01	4.4E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	6.21E-01	2.8E-02	6.8E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	4.78E-01	3.7E-02	6.0E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	6.57E-01	6.8E-02	9.5E-02	N/A	pCl/g	N/A	RICHRC5017
U-238	1.74E-01	3.4E-01	3.4E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	4.79E-02	3.5E-02	3.9E-02	1.17E-01	pCi/g	90.90%	RICHRC5006

Number of Results: 15

pu 11/25/98



LAD NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740803

MATRIX:

SOIL

CLIENT ID:

B0K0F6

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A T	EPA710
PU-238	-7.76E-04	1.6E-03	1.6E-03	3.90E-02	pCi/g	43.40%	RICHRC5010 J
PU239/40	6.60E-03	2.0E-02	2.0E-02	5.18E-02	pCi/g	43.40%	RICHRC5010
AM-241	3.89E-03	4.6E-02	4.7E-02	7.75E-02	pCi/g	N/A	RICHRC5017
CO-60	-2.23E-03	8.8E-03	8.8E-03	1.46E-02	pCi/g	N/A	RICHRC5017
CS-137DA	2.90E-02	1.2E-02	1.2E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	4.58E-02	2.0E-02	2.0E-02	3.56E-02	pCi/g	N/A	RICHRC5017
EU-154	2.21E-02	2.5E-02	2.5E-02	4.48E-02	pCi/g	N/A	RICHRC5017
EU-155	3.10E-02	2.3E-02	2.4E-02	3.90E-02	pCi/g	N/A	RICHRC5017
K-40	9.34E+00	3.7E-01	1.0E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	4.77E-01	2.3E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	3.91E-01	3.2E-02	5.1E-02	N/A	pCi/g	N/A	RICHRC5017 5
RA-228DA	5.06E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	5.23E-01	5.1E-01	5.1E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	4.63E-02	3.6E-02	3.9E-02	1.20E-01	pCi/g	84.40%	RICHRC5006

Number of Results: 15

pu 11/23/98 00008



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740804

MATRIX:

SOIL

CLIENT ID:

BOKOF7

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME -	- 3.00E-02	N/A	N/A	3.00E-02	- mg/kg	-N/A	EPA719
PU-238	-9.05E-04	1.8E-03	1.8E-03	4.55E-02	pCi/g	35.50%	RICHRC5010 J
PU239/40	3.21E-02	3.9E-02	4.0E-02	5.16E-02	pCi/g	35.50%	RICHRC5010
AM-241	5.90E-02	3.4E-02	3.4E-02	5.58E-02	pCi/g	N/A	RICHRC5017 J
CO-60	3.34E-02	1.1E-02	1.1E-02	2.17E-02	pCi/g	N/A	RICHRC5017
CS-137DA	2.01E-01	1.8E-02	2.7E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	3.74E-01	4.5E-02	5.9E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	4.51E-02	3.2E-02	3.2E-02	5.67E-02	pCi/g	N/A	RICHRC5017
EU-155	3.96E-02	2.7E-02	2.8E-02	4.42E-02	pCi/g	N/A	RICHRC5017
K-40	1.07E+01	4.2E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.57E-01	2.9E-02	6.3E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	4.65E-01	3.9E-02	6.1E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	5.71E-01	7.5E-02	9.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	8.40E-01	4.1E-01	4.2E-01	N/A	pCi/g	N/A	RICHRC5017 J
STRONTIUM	2.37E-01	5.9E-02	1.0E-01	1.41E-01	pCi/g	90.10%	RICHRC5006

Number of Results: 15

11/25/98 0000



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740805

MATRIX:

SOIL

CLIENT ID:

BOKOF8

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME -	-3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A -	EPA7100
PU-238	-1.22E-03	1.7E-03	1.7E-03	3.48E-02	pCi/g	40.80%	RICHRC5010 J
PU239/40	3.51E-02	3.4E-02	3.5E-02	4.31E-02	pCì/g	40.80%	RICHRC5010
AM-241	5.40E-03	3.6E-02	3.6E-02	5.66E-02	pCi/g	N/A	RICHRC5017 J
CO-60	3.02E-02	1.1E-02	1.1E-02	2.10E-02	pCi/g	N/A	RICHRC5017
CS-137DA	1.74E-01	1.6E-02	2.4E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	3.32E-01	4.2E-02	5.4E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	7.62E-03	3.1E-02	3.1E-02	5.28E-02	pCi/g	N/A	RICHRC5017
EU-155	3.18E-02	2.5E-02	2.5E-02	4.17E-02	pCi/g	N/A	RICHRC5017
K-40	9.80E+00	3.9E-01	1.1E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.11E-01	2.6E-02	5.7E-02	N/A	pCi/g	N/A	RICHRC5017 T
RA-226DA	3.98E-01	3.6E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	5.15E-01	7.1E-02	8.8E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.26E-01	3.0E-01	3.1E-01	4.99E-01	pCi/g	N/A	RICHRC5017 I
STRONTIUM	3.04E-01	6.1E-02	1.2E-01	1.15E-01	pCi/g	93.70%	RICHRC5006

Number of Results: 15

ph 10/25/58



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740806

MATRIX:

SOIL

CLIENT ID:

В0К0Н0

DATE RECEIVED:

7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME -	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPAT/66
PU-238	0.00E+00	0.0E+00	3.2E-02	2.88E-02	pCi/g	28.00%	RICHRC5010
PU239/40	-8.51E-04	1.7E-03	1.7E-03	4.28E-02	pCi/g	28.00%	RICHRC5010
AM-241	-1.38E-02	2.9E-02	2.9E-02	4.54E-02	pCi/g	N/A	RICHRC5017 J
CO-60	9.53E-03	8.0E-03	8.1E-03	1.50E-02	pCi/g	N/A	RICHRC5017
CS-137DA	4.61E-03	6.6E-03	6.6E-03	1.11E-02	pCi/g	N/A	RICHRC5017
EU-152	8.22E-03	1.7E-02	1.7E-02	2.86E-02	pCi/g	N/A	RICHRC5017
EU-154	-1.25E-03	3.3E-02	3.3E-02	5.51E-02	pCi/g	N/A	RICHRC5017
EU-155	2.38E-02	1.9E-02	1.9E-02	3.30E-02	pCi/g	N/A	RICHRC5017
K-40	1.61E+01	4.7E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	2.26E-01	1.8E-02	2.9E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	1.98E-01	3.0E-02	3.6E-02	N/A	pCi/g	N/A	RICHRC5017 J
 RA-228DA	2.03E-01	5.2E-02	5.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	1.14E-01	2.5E-01	2.5E-01	4.00E-01	pCi/g	N/A	RICHRC5017 J
STRONTIUM	2.66E-02	3.1E-02	3.2E-02	1.15E-01	pCi/g	90.10%	RICHRCS006

Number of Results: 15

PRe 11/25/58



LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

70740807

MATRIX:

SOIL

CLIENT ID:

B0K0H1

DATE RECEIVED:

7/29/1997 11:35:00 AM

E RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
ME 3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
3.47E-03	9.2E-03	9.2E-03	2.28E-02	pCi/g	66.90%	RICHRC5010 ゴ
0 -3.65E-04	7.3E-04	7.3E-04	1.84E-02	pCi/g	66.90%	RICHRC5010
2.70E-03	3.4E-02	3.4E-02	5.43E-02	pCi/g	N/A	RICHRC5017
1.89E-02	8.5E-03	8.7E-03	1.64E-02	pCi/g	N/A	RICHRC5017
A -2.14E-03	6.6E-03	6.6E-03	1.11E-02	pCi/g	N/A	RICHRC5017
1.18E-02	1.7E-02	1.7E-02	2.93E-02	pCi/g	N/A	RICHRC5017
-4.45E-02	3.2E-02	3.3E-02	5.06E-02	pCi/g	N/A	RICHRC5017
-3.43E-03	2.1E-02	2.1E-02	3.33E-02	pCi/g	N/A	RICHRC5017
1.63E+01	4.6E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
A 2.08E-01	2.4E-02	3.2E-02	N/A	pCi/g	N/A	RICHRC5017 J
A 2.03E-01	2.8E-02	3.5E-02	N/A	pCi/g	N/A	RICHRC5017 J
A 2.45E-01	4.0E-02	4.7E-02	7.99E-02	pÇi/g	N/A	RICHRC5017
1.90E-01	2.7E-01	2.7E-01	4.46E-01	pCi/g	N/A	RICHRC5017
JM 1.57E-02	3.4E-02	3.5E-02	1.37E-01	pCi/g	94.20%	RICHRC5006
	3.47E-03 3.47E-03 0 -3.65E-04 2.70E-03 1.89E-02 0A -2.14E-03 1.18E-02 -4.45E-02 -3.43E-03 1.63E+01 0A 2.03E-01 1.90E-01	E RESULT ERROR (2 s) ME 3.00E-02 N/A 3.47E-03 9.2E-03 0 -3.65E-04 7.3E-04 2.70E-03 3.4E-02 1.89E-02 8.5E-03 A -2.14E-03 6.6E-03 1.18E-02 1.7E-02 -4.45E-02 3.2E-02 -3.43E-03 2.1E-02 1.63E+01 4.6E-01 A 2.08E-01 2.4E-02 A 2.03E-01 2.8E-02 1.90E-01 2.7E-01	E RESULT ERROR (2 s) ERROR (2 s) ME	E RESULT ERROR (2 s) ERROR (2 s) MDA/IDL ME	E RESULT ERROR (2 s) ERROR (2 s) MDA/IDL UNIT ME	RESULT ERROR (2 s) ERROR (2 s) MDA/IDL UNIT YIELD ME 3.00E-02 N/A N/A 3.00E-02 mg/kg N/A 3.47E-03 9.2E-03 9.2E-03 2.28E-02 pCi/g 66.90% 0 -3.65E-04 7.3E-04 7.3E-04 1.84E-02 pCi/g 66.90% 2.70E-03 3.4E-02 3.4E-02 5.43E-02 pCi/g N/A 1.89E-02 8.5E-03 8.7E-03 1.64E-02 pCi/g N/A 1.89E-02 1.7E-03 6.6E-03 1.11E-02 pCi/g N/A 1.18E-02 1.7E-02 1.7E-02 2.93E-02 pCi/g N/A -4.45E-02 3.2E-02 3.3E-02 5.06E-02 pCi/g N/A -3.43E-03 2.1E-02 2.1E-02 3.33E-02 pCi/g N/A 1.63E+01 4.6E-01 1.7E+00 N/A pCi/g N/A 1.4 2.08E-01 2.4E-02 3.2E-02 N/A pCi/g N/A 2.03E-01 2.8E-02 3.5E-02 N/A pCi/g N/A 1.90E-01 2.7E-01 2.7E-01 4.46E-01 pCi/g N/A

Number of Results: 15

Phi 11/25/58

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc. 3350 George Washington Way Richland, WA 99352

August 20, 1997

Attention: Joan Kessner

SAF Number : B97-091
Date SDG Closed : July 29,1997
Number of Samples : Seven (7)
Sample Type : Soil
SDG Number : W01811
Data Deliverable : Summary



I. Introduction

On July 29, 1997, seven soil samples were received by the Quanterra Environmental Services Richland Laboratory (QESRL) for radiochemical and chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

OESRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
70740801	B0K0F4	Soil	7 /29/97
70740802	B0K0F5	Soil	7 /29/97
70740803	B0K0F6	Soil	7/29/97
70740804	B0K0F7	Soil	7/29/97
70740805	B0K0F8	Soil	7/29/97
70740806	B0K0H0	Soil	7/29/97
70740807	B0K0H1	Soil	7/29/97

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.



Bechtel Hanford, Inc. August 20, 1997 Page 2

The requested analyses were:

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

Chemical Analyses

Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W01811 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results with the exception of the chemical analyses which are reported in mg/L.

IV. Comments

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010

Due to an oversight samples from SDGs W01809 and W01811 were batched together. The LCS, batch blank, sample and sample duplicate (B0K0N4) results are within contractual requirements.

Gamma Spectroscopy

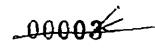
Gamma Scan by method RICH-RC-5017

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.





Bechtel Hanford, Inc. August 20, 1997 Page 3

Chemical Analysis

Chromium Hex by EPA method 7196

The original analysis of the samples was performed within the holding time. However, due to problems with the blank, the sample were reanalyzed outside holding time as per client direction. The matrix spike and matrix spike duplicate recoveries were low due to sample matrix interference. A post digestive spike was analyzed and its low recovery confirms the reducing effect of the sample. The LCS, batch blank, sample results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Jódie Carnes

Project Manager

Collector Down Bry	m-+-		Conspany Contact Duana Jacques	Tele 31	phone No. 12-9400			Project Con Koerner,			Data Turneres 13 Days				
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Appendix 5

Data Validation Supporting Documentation

WHC-SD-EN-SPP-001, Rev. 1

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	C	D	E		
PROJECT:			DATA PACKAGE: WOISI				
VALIDATOR:		LAB: QES		DATE: 11/14	94		
CASE:			SDG: WO	18(1			
		ANALYSES	PERFORMED				
☐ Grose Alpha/Beta	Strontium-80	☐ Technetium-98	Alphe	Germe Spectroscopy			
☐ Total Uranium	☐ Redium-22	☐ Tritium	0				
SAMPLES/MAT	RIX Soil				نظارها الماكنات البطين		
		S. Bokon	Fl. Boko	F7, Boko	PY		
	HO, BO1						
1. Complete	ness				TENCA		
•	rification for	ome process*2		Yes	s No N/A		
	####Cacton 101	ms presenti.		163	, 110 1177		
Comments:							
				<u>. </u>			
							
2. Initial	Calibration .	• • • • • •			IFN/A		
Instruments/	detectors cali	ibrated within	n	Ye:	\ s No N/A		
				Ye			
				Ye	_		
				Ye	_		
Comments:							
							

WHC-SD-EN-SPP-001, Rev. 1

	- Y	`.
3. Continuing Calibration	· P	WA
Calibration checked within one week of sample analysis? Yes	No	N/A
Calibration check acceptable? Yes	No	N/A
Calibration check standards NIST traceable? Yes	No	N/A
Calibration check standards expired? Yes	No	N/A
Comments:		
4. Blanks	. 0	N/A
Method blank analyzed?	No -	N/A
\smile	No	N/A
Analytes detected in method blank?	No	N/A
Field blank(s) analyzed?	No	N/A
Field blank results acceptable? Yes	6	N/A
Analytes detected in field blank(s)? Yes	No	N/A
Transcription/Calculation Errors? Yes	No (
Comments: 4-40, RA-224/224 (MB)	·	
K-40, BY-554/359/558. HO		
Co-60, 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
F. Matrix Critica		
5. Matrix Spikes		_
Matrix spike analyzed? Yes	No	N/A
Spike recoveries acceptable? Yes	No	
Spike source traceable? Yes	No	
Spike source expired? Yes	No (
Transcription/Calculation Errors? Yes	No	ΝŲ
Comments:		

A-Zille

WHC-SD-EN-SPP-001, Rev. 1

6. Laboratory Control Samples	. □ N/A
LCS analyzed?	No N/A
LCS recoveries acceptable? Yes	N/A
LCS traceable? Yes	No N/A
Transcription/Calculation Errors? Yes	No NA
Comments: U-238 -14790	
No Am-241 or Pu-238	
7. Chemical Recovery	
	□ N/A
Chemical carrier added?	No N/A
Chemical recovery acceptable? Yes	No N/A
Chemical carrier traceable? Yes	No / M/A
Chemical carrier expired? Yes	No NA
Transcription/Calculation errors? Yes	No CHTA
Comments:	
8. Duplicates	. 🗆 N/A
Duplicates Analyzed?	No N/A
RPD Values Acceptable?	No N/A
·Transcription/Calculation Errors? Yes	No N/A
Comments: U-238 (Gea) 64% (W/m +/- 40+)	
comments	
	

000027

Field duplicate sample(s) analyzed? Yes No Field duplicate RPD values acceptable? Yes No Field split sample(s) analyzed?	N/A N/A N/A N/A N/A
10. Holding Times Are sample holding times acceptable? Yes No Comments:	N/A
Results reported for all required sample analyses?	N A A A A A A A A A A A A A A A A A A A

Ask



LABORATORY CONTROL SAMPLE

LAB NAME:

QUANTERRA, Richland

SDG: /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

T074081M

MATRIX:

SOIL

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
CS-137DA	3.31E-01	3.6E-02	4.9E-02	N/A	pCi/g	N/A	3.48E-01	95.00%
K-40	1.90E+01	7.6E-01	2.0E+00	N/A	pCi/g	N/A	1.95E+01	97.03%
RA-226DA	9.67E-01	7.5E-02	1.2E-01	N/A	pCi/g	N/A	1.15E+00	83.82%
RA-228DA	2.10E+00	1.5E-01	2.6E-01	N/A	pCi/g	N/A	1.87E+00	112.12%
U-238	1.55E+00	8.4E-01	8.5E-01	1.39E+00	pCi/g	N/A	1.05E+00	147.71%

Number of Results: 5



BLANK RESULTS

LAB NAME:

QUANTERRA, Richland

SDG /RPT GRP:

W01811 / 3274

LAB SAMPLE ID:

T074081X

MATRIX:

SOIL

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER	
 AM-241	1.14E-02	1.8E-02	1.8E-02	3.08E-02	pCi/g	N/A	RICHRC5017	_
CO-60	5.96E-03	2.6E-03	2.7E-03	6.82E-03	pCi/g	N/A	RICHRC5017	
CS-137DA	-1.22E-03	4.0E-03	4.0E-03	6.80E-03	pCi/g	N/A	RICHRC5017	
EU-152	1.34E-02	1.0E-02	1.0E-02	1.92E-02	pCi/g	N/A	RICHRC5017	
EU-154	-7.69E-03	1.2E-02	1.2E-02	1.99E-02	pCi/g	N/A	RICHRC5017	
EU-155	4.41E-03	1.0E-02	1.0E-02	1.75E-02	pCi/g	N/A	RICHRC5017	
K-40	2.59E-01	6.7E-02	7.2E-02	1.50E-01	pCi/g	N/A	RICHRC5017	
RA-224DA	4.64E-02	1.0E-02	1.1E-02	N/A	pCi/g	N/A	RICHRC5017	
RA-226DA	7.25E-02	1.4E-02	1.6E-02	N/A	pCi/g	N/A	RICHRC5017	
RA-228DA	3.46E-02	1.8E-02	1.8E-02	3.46E-02	pCi/g	N/A	RICHRC5017	
U-238	9.07E-02	1.7E-01	1.7E-01	2.84E-01	pCi/g	N/A	RICHRC5017	

Number of Results: 11

00014

THE CONTENT

509

372

Bechtel Hanford, Inc. 3350 George Washington Way Richland, WA 99352

Attn: BHI Sample Management 3190 George Washington Way

MSIN: H9-03 Phone: 375-9439 FAX: 372-9487

BHI Sample Management

Fax

To:	<u> </u>	From:	<u> </u>	<u> </u>
Fax:	<u> </u>	Pages	:	
Phone:		Date:		
Re:		CC:		
□ Urgent	☐ For Review	☐ Please Comment	☐ Please Reply	🗆 Please Recycle
• Commen	ts:			
			ee <u> </u>	
			<u>,</u>	

Review Comment Record (RCR)					1. Date 12/14/98		2. Review No. BHI/QA98016		
}				1	3. Project		4. Page		
					107-D1		Page 1 of 1		
5. Do	5. Document Number(s)/Title(s) 6. Program/Project/ Building Number 7.				8. Organization/Group		9. Location/Phone		
WO1811-QES (SDG No. WO1811)		107 D1 Trench Confirmation	Claude Stacey		BHI/QA		H0-16/372-9208		
17. Co	mment Submittal Approval:	10. Agreement with indicated co	mment dispositi	on(s)	11. CLOSED				
Org	ganization Manager (Optional)	Date	wer/Point of Co	ntact	Date	_ F	Reviewer/Point of Conta	ect	
		Autho	r/Originator		- -		Author/Originator		
12. Item	13. Comment(s)/Discrepancy(s) (Provide techn recommendation of the action required to correct			15. Disposi	tion (Provide justification if NOT acc	epted.)		16. Status	
Radchem: Page 010, Sample B0K0H0, Uranium-238 (GEA) shows value as 1.14; whereas, laboratory data sheet (page 016) has the value as 1.14E-01 (0.114).			as				·		
2	Pesticide/PCB and Inorganics - No Co	mments							
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		·							

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				-						

ERRORS

1) HANG UP OR LINE FAIL

2) BUSY

3) NO ANSWER

4) NO FACSIMILE CONNECTION

Bechtel Hanford, Inc. 3350 George Washington Way Richland, WA 99352

Attn: BHi Sample Management 3190 George Washington Way

MSIN: H9-03 Phone: 375-9439 FAX: 372-9487 BHI Sample Management



To: Byll	ice Chreisti	an From:	Jeanet	1 Duca	1
Fax: 3	75-5151	Pages			
Phone:		Date:			
Rei		CC:			
T Elmant	To the Booksea	□ Please Comment	🗆 Piease Reply	☐ Please Recycle	

Duncan, Jeanette M

From:

Sent:

Blumenkranz, David B Wednesday, December 09, 1998 10:03 AM Duncan, Jeanette M

To:

Cc:

Subject:

Sturges, Mark H; Fancher, Jonathan D (Jon)
Data Validation Package for Radiochemistry W01811-QES

Jeanette,

Hear are my comments on the Data Validation Package for Radiochemistry W01811-QES:

Precision, p. 3, Sentences 3 through 6: use the words "(acceptable RPD)" after "control limit" or else the sentences don't seam to make much sense to the non-validator.

Other than that, it looks good.

Thanks, Dave

Duncan, Jeanette M

From:

Blumenkranz, David B

Sent:

Monday, December 07, 1998 8:24 AM

To:

Duncan, Jeanette M

Cc: Subject: Sturges, Mark H; Fancher, Jonathan D (Jon)

107-D1 Data Validation Packages

Jeanette.

My comments on the 107-D1 Data Validation Packages are as follows:

Pest/PCB Data Package W01811-QES:

Analytical Detection Levels description, indicate that CRDLs and TDLs were met (this is because the CRDLs and TDL are not necessarily the same, the validator should look at both criteria).

Inorganics Data Package W01811-QES:

Holding Time description, 1st sentence, indicate that lead and Cr⁺⁶ were evaluated.

Analytical Detection Levels description, indicate that CRDLs and TDLs were met (this is because the CRDLs and TDL are not necessarily the same, the validator should look at both criteria).

Let the validator know that the inclusion of the field & equipment blanks (both had detectable lead) in the *Minor Deficiencies* summary was helpful. Even thought no data qualification was required, the problems with the field & equipment blank were worth noting.

Thanks, Dave